

Applying Clean Screen Remote Sensing Program to Heavy Duty Gasoline Vehicles

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I merged the July through December 1997 Arizona idle I/M test result data with remote sensing data, and got 4,156 heavy duty gasoline vehicles (HDTs) with both RSD and idle tests (or 16% of the 26,000 HDTs given idle tests). The coverage is low, because I used only 6 months of idle data (as opposed to 18 months for the matching with IM240 data). Figure 1 shows the distribution of matched vehicles by model year. Only 2,471 HDTs (or 10% of all HDTs) have more than one RSD reading.

Figures 2 through 5 show idle, loaded idle, and RSD measurements on the same vehicles from the last 6 months of 1997 in Arizona. RSD measurements are the average of all readings for a particular vehicle up to 365 days prior to initial I/M test. Figures 2 and 3 show that RSD CO and HC are higher than idle CO and HC for HDTs; RSD HC for older HDTs is much higher than idle HC. Both CO and HC RSD curves show an increase in emissions for MY94 and MY95 HDTs.

Figures 4 and 5 compare idle, loaded idle, and RSD measurements on light-duty vehicles. Here old vehicles have about the same idle and RSD emissions, but new vehicles have much higher RSD emissions than idle emissions.

Applying the same RSD cutpoints as I used in the analysis of light duty vehicles, 200 ppm HC and 0.5 % CO, results in 24% of HDTs being excused from I/M testing, while retaining 93% of excess idle HC and 94% of excess idle CO, and retaining 100% of excess loaded idle HC and 95% of excess loaded idle CO. Table 1 shows the effect of exempting whole model years of HDTs from testing. If MY90 and newer trucks are exempted from I/M testing, the program would test 60% of the trucks (i.e. excusing 40% from testing), while retaining 98% and 95% excess idle HC and CO, and 93% and 91% excess loaded HC and CO.

Figure 1. Number of Vehicles with RSD Reading, by Model Year and Type

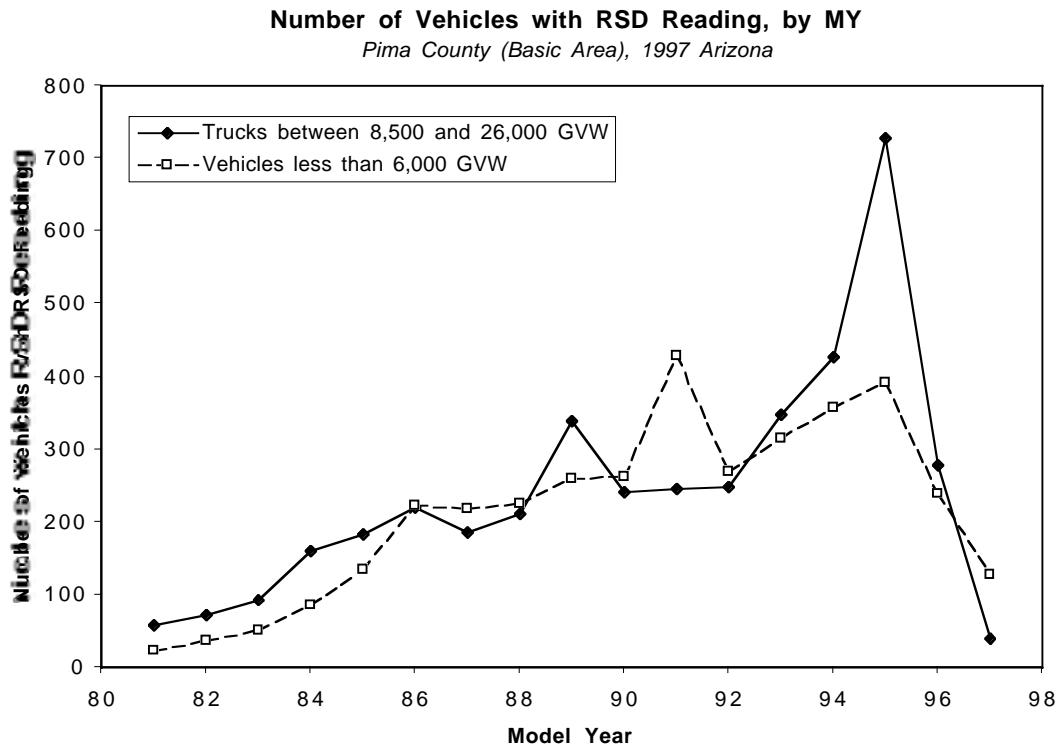


Figure 2. Average CO by Model Year, Heavy Duty Gasoline Vehicles

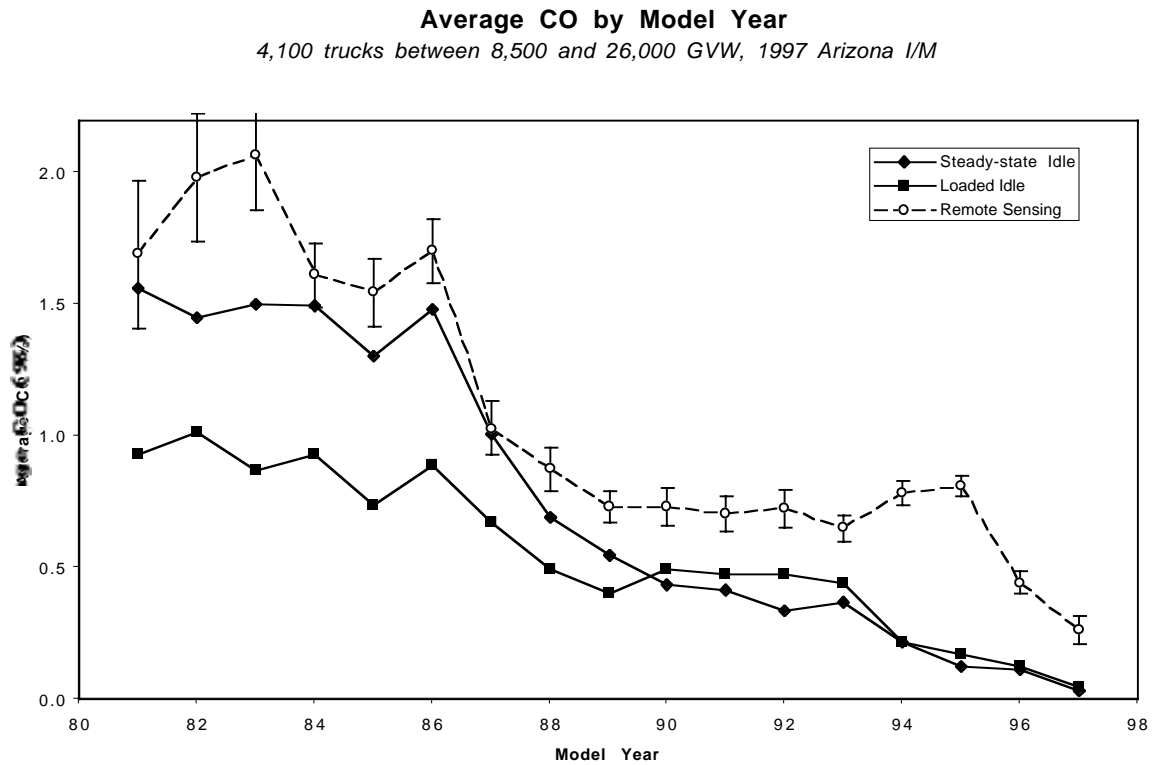


Figure 3. Average HC by Model Year, Heavy Duty Gasoline Vehicles

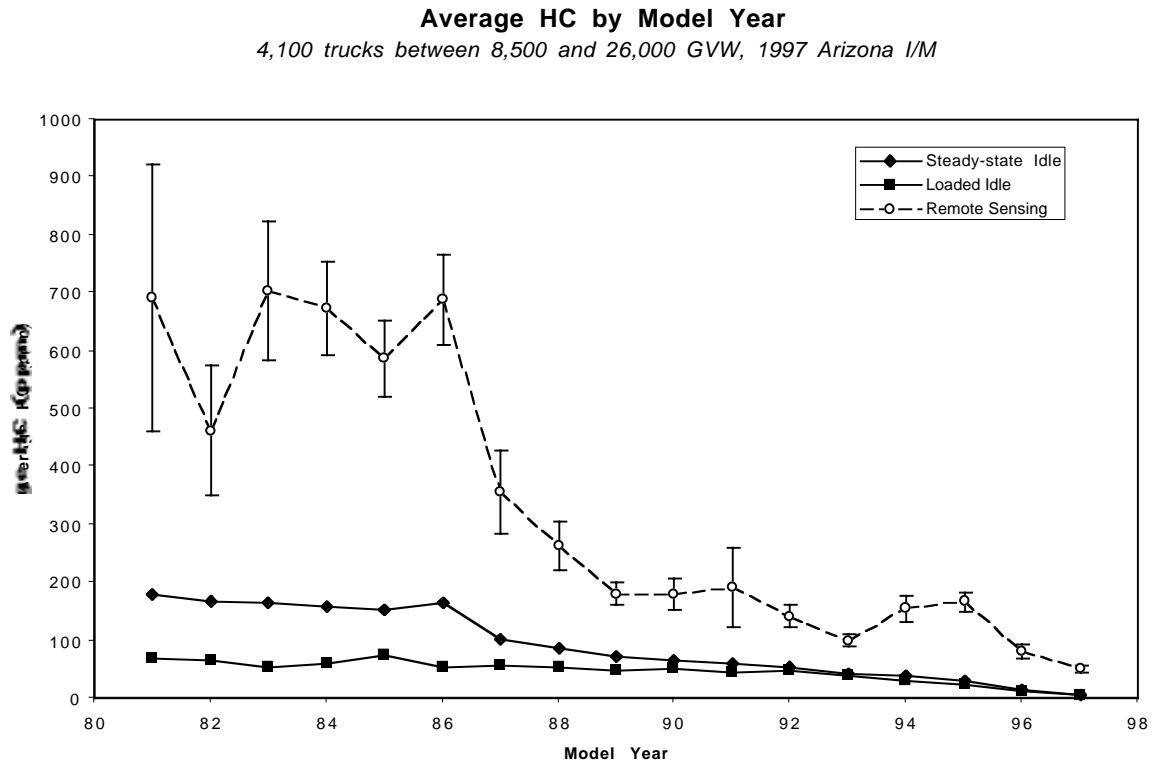


Figure 4. Average CO by Model Year, Light Duty Vehicles

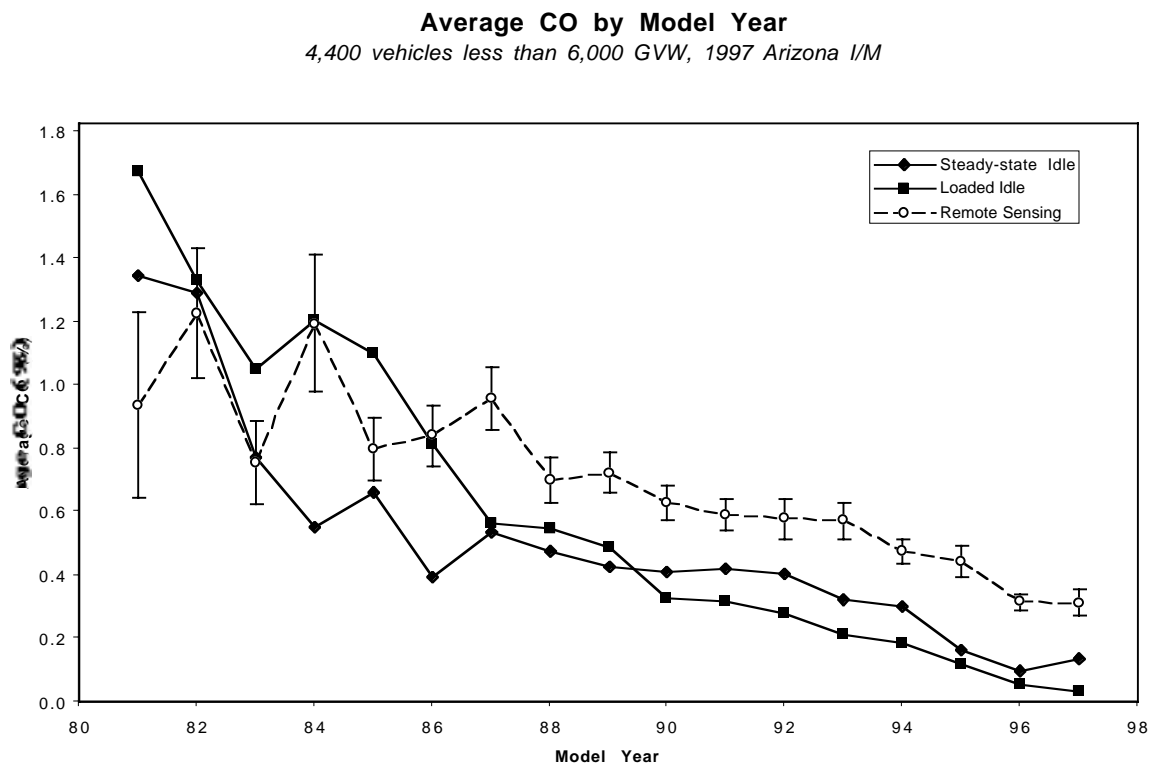
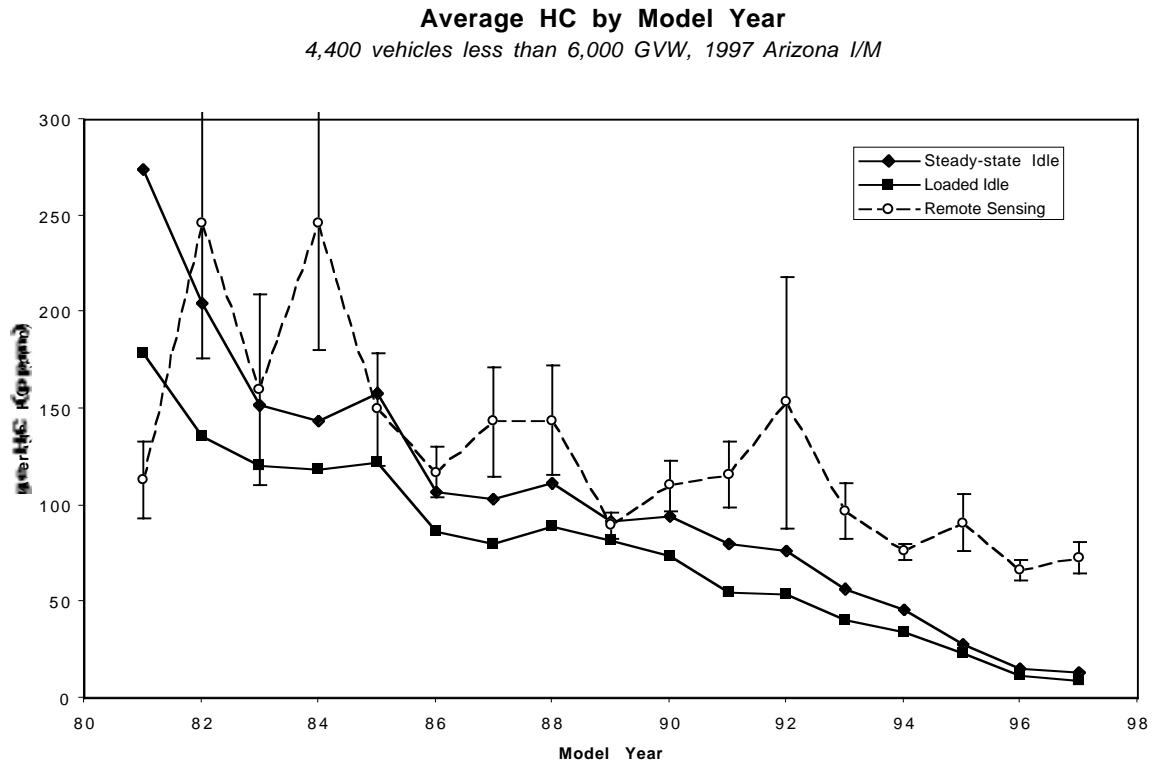


Figure 5. Average HC by Model Year, Light Duty Vehicles



**Table 1. Distribution of Initial Idle Test
Emissions of 29,000 Gasoline Trucks between
8,500 and 26,000 GVW**

July-December 1997 Arizona I/M

MY	Cumulative Distribution				
	Vehicles	Excess Idle		Excess Loaded	
		HC	CO	HC	CO
67	0%	0%	0%	0%	1%
68	0%	0%	0%	0%	1%
69	0%	0%	1%	0%	2%
70	1%	1%	1%	0%	3%
71	1%	2%	3%	0%	4%
72	1%	3%	4%	1%	5%
73	2%	6%	6%	2%	7%
74	3%	7%	8%	3%	9%
75	4%	8%	9%	3%	10%
76	5%	11%	14%	4%	14%
77	6%	13%	17%	4%	17%
78	8%	16%	24%	5%	22%
79	11%	20%	30%	6%	26%
80	14%	27%	37%	9%	31%
81	16%	30%	41%	10%	34%
82	18%	37%	46%	19%	40%
83	21%	43%	51%	24%	45%
84	24%	49%	57%	28%	53%
85	29%	60%	65%	42%	62%
86	36%	74%	74%	65%	71%
87	42%	86%	85%	77%	79%
88	47%	93%	90%	87%	84%
89	53%	96%	93%	91%	88%
90	60%	98%	95%	93%	91%
91	65%	99%	96%	96%	94%
92	70%	99%	97%	96%	95%
93	75%	99%	97%	96%	96%
94	80%	99%	99%	96%	99%
95	86%	100%	100%	98%	100%
96	95%	100%	100%	100%	100%
97	99%	100%	100%	100%	100%
98	100%	100%	100%	100%	100%